

Globelics Academy 2008

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Sectoral systems of innovation

Research on innovation in sectors is an old but always rich tradition

Innovation is relevant in all sectors

The specificities of technologies and sectors are extremely important

Different sectoral patterns

Also traditional sectors are innovative

How to analyze innovation in a sector?

DIFFERENT TRADITIONS

1. Structure-conduct-performance

Transaction costs

Game theory

2. Case studies

3. Taxonomies

Schumpeter mark I and II

Pavitt

Sectoral systems of innovation

The SPRU tradition

Evolutionary theory

Innovation systems approach

A sectoral system perspective focusses on firms, capabilities and learning processes as major drivers of innovation

But also pays a lot of attention to:

- the knowledge base of sectors
- other actors relevant for innovation
- links and networks
- Institutions
- processes of competition, cooperation and co-evolution

SECTORAL SYSTEMS OF INNOVATION (1)

Three building blocks:

1. KNOWLEDGE AND TECHNOLOGICAL DOMAIN

BOUNDARIES, LINKS AND COMPLEMENTARITIES

2. ACTORS AND NETWORKS

ORGANISATIONS AND INDIVIDUALS

MARKET AND NON MARKET RELATIONSHIPS

DEMAND

3. INSTITUTIONS

NORMS, ROUTINES, COMMON HABITS, RULES ...

THE KNOWLEDGE BASE OF INNOVATIVE ACTIVITIES CONTINUOUSLY CHANGES. THIS CHANGE AFFECTS THE BOUNDARIES OF SECTORAL SYSTEMS

Knowledge is key for an explanation of the rate and direction of technological change, the organisation of innovative activities and the factors at the base of successful performances

CHANGES IN THE KNOWLEDGE BASE CHANGE THE TYPES OF RELEVANT ACTORS AND THE STRUCTURE OF NETWORKS IN SECTORAL SYSTEMS

A rich and multisource knowledge base and a rapid technological change implies a great heterogeneity of actors in most sectors

IN ADDITION

- a. national institutions have different effects on sectoral systems
- b. sectoral systems are in continuous transformation.
new sectoral systems may emerge
- c. coevolutionary processes involving knowledge, technology, actors and institutions drive sectoral growth and change
- d. the dimensions of sectoral systems are not necessarily national.
they may be local, national as well as global.

A sectoral system approach for the study of innovation in sectors:

- Is not a straight jacket, but broad, flexible and adaptable: it points to some key variables and some fundamental relationships
- It has a link with theory
- It enables quantitative analyses
- It allows for different levels of aggregation, depending on the purpose of the analysis
- It allows for comparative analysis across industries and across countries
- It provides a framework for policy

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Sectors

BIOTECHNOLOGY AND PHARMACEUTICALS

TELECOM EQUIPMENT AND SERVICES

CHEMICALS

SOFTWARE

MACHINE TOOLS

SERVICES: RETAILING, MEDICAL, AIRPORT

AN INITIAL TYPOLOGY OF SECTORAL SYSTEMS IN EUROPE

BIOTECHNOLOGY AND PHARMACEUTICALS: major role of science, networks and division of innovative labour. Various actors (large firms, NBF, universities, venture capital) and institutions (regulation, demand and national health systems, IPR).

TELECOM EQUIPMENT AND SERVICES: convergence of different technologies, knowledge integration and combination, production specialisation. Privatisation and liberalisation. Standards.

CHEMICALS. Continuity of large multinational firms through R-D, scale and scope, and vertical division of labour. Presence of internal as well as external R-D

SOFTWARE. Highly differentiated knowledge base and variety of applications, and firms' innovative specialisation. Advanced human capital mobility. Role of IPR and standards.

MACHINE TOOLS. Application specific knowledge base, firms' specialisation and user-producer interaction, local innovation systems

■ THIS AFTERNOON

■ CATCHING UP AND SECTORAL
SYSTEMS